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1: J Allergy Clin Immunol 2001 Jul;108(1):109-15

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J Allergy Clin Immunol

# **Release of allergen-bearing cytoplasm from hydrated pollen: a mechanism common to a variety of grass (Poaceae) species revealed by electron microscopy.**

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**BACKGROUND:** The release of submicronic particles from grass pollen after rainfall was suggested to be responsible for outbreaks of grass pollen asthma. Recently, we provided evidence for the release of respirable allergen-bearing particles from hydrated ryegrass (*Lolium perenne*) pollen as a possible explanation for this phenomenon. **OBJECTIVE:** We investigated whether water-induced release of respirable allergen-bearing particles could be a mechanism common to several members of the sweet grass family Poaceae (Gramineae). **METHODS:** Pollens from 6 different Poaceae species were hydrated in water and examined by means of scanning electron microscopy for release of cytoplasmic materials. Rabbit antisera raised against purified recombinant group 1 and 5 allergens were used for immunogold labeling of expelled materials by means of field emission scanning electron microscopy. In addition, group 1 and 5 allergens were immunogold-localized on ultrathin sections. **RESULTS:** Fresh Poaceae pollens expelled cytoplasmic materials containing group 1 and 5 allergens on hydration in water. Expulsion of submicronic particles strongly decreased after 1 month of storage. **CONCLUSIONS:** Our results suggest expulsion of cytoplasm after hydration as a mechanism common to pollens of important allergenic grasses. The water-induced release of respirable allergen-bearing particles from grass pollens might explain asthma attacks observed after rainfall during the grass pollen season.

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